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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/773,815
Filing Date: January 31, 2001
Appellant(s): CARPENTER, WILLIAM T.

John M Mings
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/12/2008 appealing from the Office action mailed 7/19/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

Ex Parte William T. Carpenter, Appeal No. 2006-0089, dated 21 April 2006.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

It is noted that claim 13 is objected to by the examiner because the amendment dated 11/13/2006 omitted the word “substance”

(4) Status of Amendments After Final

The appellant’s statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant’s statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Held, Isaac "The Gap between Simulation and Understanding in Climate Modeling"---Bulletin of American Meteorological Society, November 2005 pp 1609-1614.

BBC NEWS "Alarm at new climate warning,"1/2005-retrieved 7/10/07 from http ://newsv~te.bbc.c~.uk~mpapps/paget~~~s/print~news.bbc.c~.uk~2~hi/science/nature/4 2106 29.stm

Huang, R., et al. "Computer Modelers Stimulate Real and Potential Climate, Work toward Prediction" http:llwww.whoi.eduloceanuslprintArticle.do?id=2324 dated 19/1996, retrieved 7/11/07

"A model approach to climate change" dated 212007, http:llphysicsweb.orglarticleslworldl201213 retrieved 7/11/07

Thomas Herring, "Geodesy", in AccessScience@McGraw-Hill, http://www.accessscience.com, DOI 10.1036/1097-8542.286100, last modified: May 17. 2002 .

Chao, B.F., "Excitation of the Earth's Polar Motion due to Mass Variations in Major Hydrological Reservoirs", J. Geophys. Res., 93. 13811-13819, 1988.

Brown "Cataclysms of the Earth" 1966 pp151-156.

White "Pole Shift: predictions and prophesies of the ultimate disaster" 1980 pp 80, 81,180, 181.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 11-20 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility.

Claim 11 (as currently amended) is drawn to "[a] method of modifying the orientation of the axis of rotation of a planet". Applicant discloses (specification, page 5, line 26) that the change would affect "*the Earth's climatic pattern due to the change in angle of incidence to the Sun*." Applicant has not disclosed any further effects of modifying the axis of rotation. In response to the requirement for information, applicant stated: "*The utility of the invention is modification of the axis of rotation of a planet, Specification, p.4, Ins. 20-26, thereby affecting the planet's climatic pattern, Id., p. 5, Ins. 24-26. The desired affect is reasonably determined by one of ordinary skill in the art without undue experimentation.*"

A "specific utility" is specific to the subject matter claimed and can "provide a well-defined and particular benefit to the public." In re Fisher, 421 F.3d 1365, 1371, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). This disclosed effect (altering the Earth's climate pattern) does not constitute a specific utility, since it does not provide a well-defined and particular benefit to the public; therefore the claimed invention fails to meet the requirements of 35 U.S.C. 101, for the reasons set forth below:

As applicant has disclosed; such modification would alter the angle of incidence of the sun to the earth, depending on the magnitude and direction of the modification. It is not disputed that the angle of sunlight reaching a location on the Earth's surface is dependent on the relative latitude of the location. This is due to the fact that the axis of the Earth is tilted relative to the solar system in inertial space. This tilt also

provides for the variation in length of daylight hours in each location, depending on latitude and season. Modifying the orientation of the axis of rotation relative to the Earth's crust would therefore change the length of daylight and the angle of the suns rays for each location on Earth, depending on the magnitude and direction of such modification relative to the celestial poles. It should be readily apparent that there is an infinite number of possible modifications, and it is noteworthy that applicant has not provided a single example.

Consider a hypothetical case of modifying the orientation of the axis in such a manner that it would appear that the geographic North Pole moves southwards in a direction opposite to the prime meridian. This would result in an apparent move of the city of London towards the rotational axis which corresponds to the celestial North Pole. London would therefore receive less hours of sunlight in Winter, and more in Summer—depending on the magnitude of the modification. London would also experience a change in the angle of the sun's rays: if London were to move towards the apparent or celestial North Pole, it would receive sunlight at a shallower angle, getting less energy and heat from the sun. Looking at a globe, one would see that this move would simultaneously move Eastern Siberia away from the rotational pole; in the opposite direction of London, since Siberia is located near the opposite meridian. That portion of Siberia would therefore receive more direct solar energy, but would also receive more hours of daylight in winter, and less in summer. Such a change would also affect the hours of light and angle of incidence of the sun on every spot on the globe: some would be moved closer to the equator, resulting in an

increase of direct solar energy; while others would be moved towards the poles, resulting in a decrease in direct solar energy. Not only would some spots receive more or less solar energy, but the magnitude of change would be different for every spot on the globe: locations along the prime meridian and 180° would experience the greatest change, and other locations would experience differing amounts of change, depending on their latitude and longitude. How can one of ordinary skill in the art know what change in the orientation of the Earth's axis---"affecting the planet's climatic pattern" would result in a benefit to the public? Applicant provides no guidance on how to determine a climate pattern which would result from such a change, nor does applicant provide any guidance on how to determine whether a particular climate pattern would be beneficial.

Climate is notoriously difficult to model and predict: see, for example, "A Model Approach to Climate Change"---(2007), in particular see page 3, third paragraph, second sentence: "*The spacing between these points dictates the resolution of the model, which is currently limited by available computing power to about 200 km in the horizontal direction*…" This provides evidence that the current state (i.e. in 2007) of climate modeling is rough at best----the resolution of the Earth model is only one factor which affects the computations. See also "Computer Modelers Stimulate Real and Potential Climate, Work toward Prediction"---(December 1996), in particular, page 1, fourth paragraph , last sentence: *So, even though the weather can be forecast for a week without considering oceanic circulation, climate on time scales longer than a month must include the ocean*." And the ultimate sentence:

"*With the rapid advance of computer technology and our understanding of ocean physics, oceanic forecasting will eventually become a reality—perhaps early in the 21st century, marine and climate forecasting will become routine*." See also "Alarm at new climate warning"—2005, particularly, "*So no two simulations will produce exactly the same results. Overall the project produces a picture of the possible range of outcomes given the present state of scientific knowledge*." Also noted is "The Gap between Simulation and Understanding in Climate Modeling" which discuss the difficulties and inaccuracies inherent with climate modeling. These references provide evidence of the level of knowledge of one of ordinary skill in the art of climate modeling. It is clear that the level of knowledge is advancing, but today, and at the time of invention, the level of knowledge of one of ordinary skill in the art was not sufficient to enable one to determine a climate pattern which would result from a change in the orientation of the Earth's axis, nor how to determine whether a particular climate pattern would be beneficial. Therefore, since the disclosure lacks any specific examples of use which would provide a well defined and particular benefit to the public, and since one of ordinary skill in the art would not be able to determine a well defined and particular benefit to the public; the claimed invention lacks patentable utility. A "specific utility" is specific to the subject matter claimed and can "provide a well-defined and particular benefit to the public." In re Fisher, 421 F.3d 1365, 1371, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005).

Concurrently, claims 11-20 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific

and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

2. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "calculating a moment of stability required to cause the desired orientation of the axis of rotation" and "determining a position and mass" with respect to the crust of the planet, does not reasonably provide enablement for such calculating and determining with respect to modifying the axis of rotation relative to inertial space. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims.

In the requirement for information dated 1/30/07 the following question was posed to applicant: Q1: Does the "orientation of the axis" refer to (a) the orientation of the axis of the planet relative to inertial space; or (b) orientation of the axis with respect to the crust of the planet? In the reply to the requirement for information dated 3/28/07, applicant stated that "*The "orientation of the axis of rotation of a planet" refers to any axis orientation that a user of the method might desire. Specification, p.4, lns. 25-28."* It is noteworthy that applicant has not provided any equations or examples of calculations which would enable one of ordinary skill in the art to practice the claimed method steps of "calculating a moment of stability required to cause the desired orientation of the axis of rotation" and "determining a position and a mass of compensating substance sufficient to effect the moment of stability". It has previously

been determined (BPAI decision dated 4/21/06—page 6) that one of ordinary skill in the art would be able to make those calculations and determinations with respect to "a desired character of rotation". This determination was made with the evidence provided by Chao, White, and Brown. It is clear that the Earth's axis may be altered relative to its crust, but there is no indication that the Earth's axis can be altered relative to inertial space. None of these references describe changing the orientation of the axis of rotation relative to inertial space. The previously cited article "geodesy" indicates that the orientation of the axis relative to inertial space is affected by gravitational torques applied to the equatorial bulge of the Earth. Applicant has provided no evidence, examples, or calculations as to how to alter the gravitational torque. The Chao, White and Brown references make no mention of altering gravitational torque, nor do they make any mention of changes in the orientation of the axis relative to inertial space. In conclusion, one skilled in the art would not know how to practice the claimed invention; insofar as the invention relates to the orientation of the axis in inertial space.

3. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims require "selecting a desired orientation of the axis of rotation".

Applicant has asserted that the result from altering the axis of rotation is a change in the Earth's climate. It is therefore apparent that the "desired orientation of the axis

of rotation" is one that would result in a desired climate. Applicant has not provided any examples of a desired change in the axis of rotation. How would one of ordinary skill in the art determine a desired change in the axis of rotation? As shown by the referenfce cited above, climate modeling is notoriously difficult, involving iterative calculations based on a set of assumptions and inputs. It is the position of the examiner that one of ordinary skill in the art would not know how to determine whether a particular orientation of the axis would result in a beneficial climate; and applicant has plainly failed to provide any example of a desired axis of rotation. Assuming, arguendo, that one of ordinary skill in the art would be able to properly calculate the climate effects from a given change in the axis of rotation, this would not enable one to perform the method step of "selecting a desired orientation of the axis of rotation"; since one would have first select a desired climate, and then model the orientation of the axis which would achieve that climate. Reverse modeling is more difficult than the climate modeling described in the references cited above, if not impossible.

4. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao "Excitation of the Earth's Polar Motion due to Mass Variations in Major Hydrological Reservoirs" (referred to as Chao "Excitation"). Chao "Excitation" discloses a method of determining how the axis of rotation of a planet is modified by the movement of a mass (water) to a predetermined position (hydrological reservoirs), including measuring the mass of a planet (M), determining the center of mass of a planet and characterizing the axis of rotation of the planet (J2, page 13,811 col. 2, line

37 and page 13,814 col. 1, line 60 - col. 2, line 7), positioning the mass of water in the position (Table 2 which includes the mass/capacity of water and the position (latitude, longitude) of the positioned/artificial created water masses), calculating a moment of stability (page 13,811 col. 2, lines 24 to page 13, 812 col. 1, lines 12), and determining a position and a mass of compensating substance (page 13, 812 col. 1, lines 2-12) wherein two identical delta m(t) situated on the same latitude but 180 degrees apart in longitude will cancel each other in the contributions to polar motion excitation function. With respect to the phrase a mass "sufficient to effect the moment of stability", Chao "Excitation" sets forth a delta m of larger than 10^{13} kg for the polar motion excitation function to change by more than 1 mas (page 13,812 col 2, lines 22-31), even though Chao "Excitation" suggest on page 13,811 col. 1, lines 12-29) that smaller mass movements, i.e., shipping of petroleum and goods or formations of polar sea ice, floating icebergs, may effect the polar motion. Chao "Excitation" does not explicitly disclose selecting a desired character of rotation and then positioning the mass at a determined position to effect the moment of stability of the earth. Chao "Excitation" teaches the effects of the character of rotation and moment of stability of the earth caused by masses of water (major artificial reservoirs) positioned around the earth and also teaches (page 13, 812 col. 1, lines 2-12) that a change in mass Δm located on longitudinal (λ) will push the excitation pole to the opposite longitudinal ($\lambda+180^{\circ}$), while a negative Δm will do the opposite, pulling the pole toward (λ): this directly corresponds to a change in the orientation of the axis of rotation. Therefore, Chao "Excitation" teaches one of ordinary skill in the art a method of selecting a desired character of

rotation to counter the effects of the major artificial reservoirs, calculating a moment of stability required to cause this desired character of rotation (as set forth above), determining a position and a mass, i.e., an equal and opposite Δm for each of the major artificial reservoirs at a location 180˚of longitude away from each of the major artificial reservoirs, and positioning the masses in the locations to counter the adverse effects of the major artificial reservoirs. It would have been obvious to one of ordinary skill in the art to extend the teachings of Chao "Excitation" to selecting a desired character of rotation, determining a position and a mass sufficient to effect the moment of stability and positioning the mass at a location to counter the change in character of the rotational axis due to the artificial reservoirs as taught by Chao "Excitation".

With respect to claims 12, 13, and 15-20, Chao "Excitation" discloses that masses of a compensating substance sufficient to effect the moment of stability are "hydrological reservoirs, including major natural lakes, artificial reservoirs (claim 13 above ground cavity), and a groundwater aquifer (claim 12 underground cavity)" (Page 13, 811 col. 1, lines 6-8).

With respect to claim 14, Chao "Excitation" discloses that the changing mass substance is solid, i.e., "polar and alpine glaciers" (Page 13,811 col. 2, lines 42,43).

(10) Response to Argument

A. Utility:

Appellant, in his brief, argues that the claimed invention provides an alleged benefit, viz. "*altering the Earth's axis of rotation to alter the amount of light received during the earth's rotation*." (Brief page 4 line 5) It is noted that the original specification is silent regarding "light" or the "amount of light". Nonetheless, appellant has made no attempt to point out how altering the amount of light received during the Earth's rotation provides a "well-defined and particular benefit to the public" [In re Fisher, 421 F.3d 1365,1371 (Fed. Cir. 2005)]

During prosecution, appellant asserted that "*the utility of the invention is modification of the axis of rotation of a planet… thereby affecting the planet's climatic pattern*" (reply dated 3/28/07, page 1). In the rejection, Examiner has pointed out that the application fails to provide any guidance on how to determine a beneficial change in climate pattern. Examiner has also cited references describing the current state of the art in climate modeling, as well as references describing the state of art in climate modeling in 1996 ("Computer Modelers Stimulate Real and Potential Climate, Work toward Prediction") Appellant has provided no evidence in rebuttal. The evidence of record shows that at the time of invention, the state of the art of climate modeling was insufficient to determine a beneficial change in the Earth's climate pattern. Therefore, the claimed invention fails to provide a well-defined and particular benefit to the public.

With regards to appellant's arguments citing Brooktree Corp. v. Advanced Micro Devices: Examiner does not assert that the claimed invention is "inoperative". Examiner maintains that the invention is not useful. Although an invention must be operative to be useful, it does not follow that every operative invention is useful. 101 requires the invention to be useful.

B. Enablement:

1. Appellant has argued that 37CFR 1.198 bars reopening prosecution on the matter of enablement.

Examiner points out that the claims have changed in scope, and now require a change in the *orientation* of the axis of the Earth; including a change in the orientation of the axis relative to inertial space (see requirement for information dated 1/30/07 at page 2, "Q1" and reply dated 3/28/07, page 1). This matter was not previously adjudicated. See the ground of rejection numbered "2" above.

Examiner points out that the question of utility has not been previously adjudicated. A holding that the claimed invention lacks utility necessitates a rejection for lack of enablement. See In re Brana, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995); In re Jolles, 628 F.2d 1322, 1326 n.10, 206 USPQ 885, 889 n.11 (CCPA 1980); In re Fouche, 439 F.2d 1237, 1243, 169 USPQ 429, 434 (CCPA 1971). See the last paragraph under the ground of rejection numbered "1" above.

Examiner points out that while the Board held that the "calculating a moment of stability" was enabled; the Board made no adjudication regarding whether the newly claimed step of "selecting a desired orientation of the axis of rotation" was enabled. Thus this is not a matter which was already adjudicated. See the ground of rejection numbered "3" above.

2. Claims 11-20 are not enabled:

Appellant argues, inter alia, that "there does not exist such a thing as measuring an object's position with respect to inertial space" (page 6, last line-page 7 line 2). This is plainly contradicted by the cited evidence. See the cited "Geodesy" reference at page 3, under "Earth's motions", lines 2-5: "*Changes in the position of the Earth's rotation axis are of two types: changes in direction in inertial space (precession and nutation) and changes with respect to the crust of the Earth (polar motion)* "

Since appellant disavows knowledge of measuring the position of the axis in inertial space, it is clear that the claims are not enabled for modifying the orientation of the Earth's axis in relation to inertial space.

Appellant alleges that "one of ordinary skill in the art would be able to calculate the changes to the climate pattern, on a macro scale" but fails to present any evidence to support this position. Examiner has presented evidence ("A model Approach to Climate Change"-2007; also "Alarm at new climate warning"—2005 ; "The Gap between Simulation and Understanding in Climate Modeling" ; and "Computer Modelers Simulate Real and Potential Climate, Work toward Prediction"---1996;) as to the current state of the art in climate modeling, as well as the state of the art at the time of the

invention. This body of evidence shows that one of ordinary skill in the art at the time of the invention would not have been able to calculate the changes in the climate pattern.

C. Obviousness:

1. Appellant has argued that 37CFR 1.198 bars reopening prosecution on the matter of enablement.

Examiner points out that the claims have changed in scope, and now require a change in the *orientation* of the axis of the Earth. Appellant asserts that the Chao "Excitation" reference is cumulative to, or a subset of, the previously applied Chao "Anthropogenic" reference. This is clearly not true, since the previously applied "Anthropogenic" reference does not describe the change in the *orientation* of the axis, as is currently claimed. Therefore, the obviousness of the claims over Chao "Excitation" was not previously adjudicated.

2. Appellant has argued that Chao fails to teach or suggest each claimed step. Each step is identified below:

Measuring the mass of the planet: see page 13811, col. 2, equation 1 "M" is the mass of the earth.

Determining the center of mass: this is inherent in equation 1.

Characterizing the orientation of the axis of rotation: see figure 4.

Positioning the mass of water in the position (Table 2 which includes the mass/capacity of water and the position (latitude, longitude) of the positioned/artificial created water masses),

Calculating a moment of stability (page 13,811 col. 2, lines 24 to page 13, 812 col. 1, lines 12)

Determining a position and a mass of compensating substance (page 13, 812 col. 1, lines 2-12)

It is acknowledged that Chao "Excitation" does not explicitly disclose selecting a desired character of rotation and then positioning the mass at a determined position to effect the moment of stability of the earth. Chao "Excitation" teaches the effects of the character of rotation and moment of stability of the earth caused by masses of water (major artificial reservoirs) positioned around the earth and also teaches (page 13, 812 col. 1, lines 2-12) that a change in mass Δm located on longitudinal (λ) will push the excitation pole to the opposite longitudinal ($\lambda+180^{\circ}$), while a negative Δm will do the opposite, pulling the pole toward (λ): this directly corresponds to a change in the orientation of the axis of rotation. Therefore, Chao "Excitation" teaches one of ordinary skill in the art a method of selecting a desired character of rotation to counter the effects of the major artificial reservoirs, calculating a moment of stability required to cause this desired character of rotation (as set forth above), determining a position and a mass, i.e., an equal and opposite Δm for each of the major artificial reservoirs at a location $180^{\circ}$of longitude away from each of the major artificial reservoirs, and positioning the masses in the locations to counter the adverse effects of the major artificial reservoirs.

It would have been obvious to one of ordinary skill in the art to extend the teachings of Chao "Excitation" to selecting a desired character of rotation, determining a position and a mass sufficient to effect the moment of stability and positioning the mass at a location to counter the change in character of the rotational axis due to the artificial reservoirs as taught by Chao "Excitation".

(11) Related Proceeding(s) Appendix

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner's answer are provided herein.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/John Kreck/

Primary Examiner, Art Unit 3672

31 July 2008

Conferees:

David Bagnell /djb/

Meredith Petravick /mcp/

Appendix: Ex Parte William T. Carpenter, Appeal No. 2006-0089, dated 21 April 2006.